

Amendment to the Claims:

Please amend claims 1 and 58 as follows.

The following listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently amended) A pin valve assembly comprising:

a pin block housing a valve pin;

a fluid plate with a fluid channel for fluidically communicating with the valve pin, the fluid plate having a first surface and a second surface opposite the first surface;

a fitting block housing a fitting for fluidic communication with the fluid plate and for fluidic communication with fluidic components, wherein the fitting block covers the entire first surface of the fluid plate and the pin block housing covers the entire second surface of the fluid plate, and wherein the first and second surfaces extend to a periphery of the fluid plate; and

a pin valve seat in communication with the fluid channel between a first portion of the fluid channel and a second portion of the fluid channel, the pin valve seat abutting both an opening at the first portion of the fluid channel and an opening at the second portion of the fluid channel proximal to a same outer surface of the fluid plate as the opening at the first portion of the fluid channel, the pin valve seat aligned to receive the valve pin, wherein when the valve pin is seated in the pin valve seat, both the opening at the first portion of the fluid channel and the opening at the second portion of the fluid channel are blocked by the valve pin seated in the pin valve seat such that the flow of fluid in the fluid channel of the fluid plate is substantially prevented from flowing between the first and second portions of the fluid channel.

2. (Previously presented) A pin valve assembly as in claim 1 further comprising:
a fitting port, aligned with the fitting.
3. (Original) A pin valve assembly as in claim 2 wherein:
the fitting port is integrated into the fluid channel of the fluid plate.
4. (Previously presented) A pin valve assembly as in claim 1 wherein:
the pin valve seat is integrated into the fluid channel of the fluid plate.
5. (Original) A pin valve assembly as in claim 2 wherein:
the fitting port is integrated into the fitting.
6. (Previously presented) A pin valve assembly as in claim 1 wherein:
the pin valve seat is fitted to the valve pin.
7. (Original) A pin valve assembly as in claim 1 wherein:
the fitting block is coupled to the pin block with the fluid plate positioned
between the pin block and fitting block.
8. (Original) A pin valve assembly as in claim 7 wherein:
the fitting block is coupled to the pin block by a screw connection.
9. (Previously presented) A pin valve assembly as in claim 1 further comprising a
pin valve having a pin with distal and proximal ends substantially axially
disposed in a housing.
10. (Original) A pin valve assembly as in claim 9 wherein

the distal end of the pin has a diamond-like carbon coating.

11. (Previously presented) A pin valve assembly as in claim 1 wherein:

the valve pin is actuated by an actuator to provide for a distal end of the valve pin to sit in the pin valve seat substantially sealing the fluid channel and removing the distal end of the valve pin from the pin valve seat opening the fluid channel.

12. (Canceled)

13. (Previously presented) A pin valve assembly as in claim 1 wherein:

the pin valve comprises a ring seal above the distal end of the valve pin and within a pin housing for providing sealing of the fluid plate.

14. (Original) A pin valve assembly as in claim 1 wherein:

the fluidic components are an HPLC system pump syringe, pump, column, sample loop and sample syringe.

15. (Original) A pin valve assembly as in claim 1 wherein:

each valve pin is housed in a housing comprising an actuator for axially moving the valve pin to sit on the pin valve seat and substantially block fluid flow from a downstream location or remove the pin from the pin valve seat and provide for fluid flow to the down stream location.

16. (Previously presented) A pin valve assembly as in claim 1 further comprising a pin valve including pin seals, a seal load sleeve, a Belleville spring, and a nut seal around a distal end of a pin below a load ring, and a second Belleville spring and a nut above the load ring.

17. (Original) A pin valve assembly as in claim 16 wherein:

the pin seals are two polyetheretherketone washers surrounding a polytetrafluoroethylene washer.

18. (Previously presented) A pin valve assembly comprising:

a pin block for housing a plurality of pin valves;

a fluid plate with a fluid channel for fluidically communicating with the pin valves;

a fitting block for housing fittings for fluidic communication with the fluid plate and for fluidic communication with fluidic components; and

one or more pin valve seats in communication with the fluid channel between a first portion of the fluid channel and a second portion of the fluid channel, a pin valve seat of the one or more pin valve seats abutting both an opening at the first portion of the fluid channel and an opening at the second portion of the fluid channel proximal to a same outer surface of the fluid plate as the opening at the first portion of the fluid channel, the pin valve seat of the one or more pin valve seats aligned to receive a valve pin of the pin valves, wherein when the valve pin is seated in the pin valve seat, both the opening at the first portion of the fluid channel and the opening at the second portion of the fluid channel are blocked by the valve pin seated in the pin valve seat such that the flow of fluid in the fluid channel of the fluid plate is substantially prevented from flowing between the first and second portions of the fluid channel.

19. (Previously presented) A pin valve assembly as in claim 18 further comprising:

fittings housed within the fitting block.

20. (Previously presented) A pin valve assembly as in claim 19 further comprising:

one or more fitting ports, aligned with the fittings.

21. (Original) A pin valve assembly as in claim 20 wherein:

the fitting ports are integrated into the fluid channel of the fluid plate.

22. (Previously presented) A pin valve assembly as in claim 18 wherein:

the pin valve seats are integrated into the fluid channel of the fluid plate.

23. (Original) A pin valve assembly as in claim 20 wherein:

the fitting ports are integrated into the fittings.

24. (Previously presented) A pin valve assembly as in claim 18 wherein:

the pin valve seats are fitted to the pin valves.

25. (Canceled)

26. (Previously presented) A pin valve assembly as in claim 18 wherein:

each pin valve is housed in a standardized housing comprising a means for actuation for axially moving the valve pin of the pin valve to sit in the pin valve seat and substantially block fluid flow from a downstream location or remove the valve pin from the pin valve seat and provide for fluid flow to the down stream location.

27. (Original) A pin valve assembly as in claim 26 wherein:

the valve pin housing is releasably fitted to the pin block.

28. (Original) A pin valve assembly as in claim 18 wherein:
the fluid plate is stainless steel coated with a fluorocarbon polymer.
29. (Original) A pin valve assembly as in claim 28 wherein:
the fluorocarbon polymer is tetrafluoroethylene.
30. (Original) A pin valve assembly as in claim 18 wherein:
the fluid plate is stainless steel with a substantially flat fluorocarbon polymer shim on its surface that is sealed against pin block and fitting block.
31. (Original) A pin valve assembly as in claim 30 wherein:
the fluorocarbon polymer is tetrafluoroethylene.
32. (Original) A pin valve assembly as in claim 18 wherein:
the fitting block is coupled to the pin block with the fluid plate positioned between the pin block and fitting block.
33. (Original) A pin valve assembly as in claim 18 wherein:
the pin valve comprises a pin with distal and proximal ends substantially axially disposed in a housing.
34. (Original) A pin valve assembly as in claim 33 wherein:
the pin valves are actuated by an actuator to provide for the distal end of the valve pin to sit in the pin valve seat substantially sealing the fluid channel and removing the distal end of the valve pin from the pin valve seat opening the fluid channel.
35. (Original) A pin valve assembly as in claim 34 wherein:

the actuator is pneumatically operated.

36. (Original) A pin valve assembly as in claim 18 wherein:

the fluidic components are an HPLC system pump syringe, pump, column, sample loop and sample syringe.

37. (Canceled)

38. (Previously presented) A pin valve assembly comprising:

a pin block housing a plurality of pin valves and pin valve seats;
a fluid plate with one or more channels having channel ends; and
a fitting block housing fittings for fluidic communication with fitting ports in fluidic communication with the pin valve seats and for fluidic communication with fluidic components, wherein the pin valve seats are in communication with the one or more channels, a pin valve seat of the pin valve seats in communication with a fluid channel of the one or more channels, the fluid channel between a first portion of the fluid channel and a second portion of the fluid channel, the pin valve seat abutting both an opening at the first portion of the fluid channel and an opening at the second portion of the fluid channel proximal to a same outer surface of the fluid plate as the opening at the first portion of the fluid channel, wherein when a valve pin of the pin valves is seated in a pin valve seat of the pin valve seats, the valve pin blocks both the opening at the first portion of the fluid channel and the opening at the second portion of the fluid channel such that the flow of fluid through a channel of the one or more channels of the fluid plate is substantially prevented from flowing between the first and second portions of the fluid channel.

39. (Original) A pin valve assembly as in claim 38 wherein:

the fitting ports are integrated into the fluid plate.

40. (Original) A pin valve assembly as in claim 38 wherein:

the fitting ports are integrated into the fittings.

41. (Original) A pin valve assembly as in claim 38 wherein:

the valve pins are aligned with the channels of the fluid plate.

42. (Previously presented) A pin valve assembly as in claim 38 wherein:

the channels of the fluid plate comprise six channels with channel ends.

43. (Original) A pin valve assembly as in claim 38 wherein:

the pin valves each align with two channel ends of the fluid plate.

44. (Previously presented) A pin valve assembly as in claim 42 wherein:

each of the pin valve seats comprises a first passage for fluidic communication with a channel end and a second passage for fluidic communication with another channel end.

45. (Canceled)

46. (Previously presented) A pin valve assembly as in claim 44 wherein:

the valve pin is actuated to block the first and second passage of the pin valve seat by an actuator.

47. (Previously presented) A pin valve assembly as in claim 46 wherein:

the actuator is actuated pneumatically.

48. (Canceled)

49. (Original) A pin valve assembly as in claim 38 wherein:

each valve pin is housed in a standardized housing releasably fitted to the pin block.

50. (Original) A pin valve assembly as in claim 38 wherein:

the fluid plate is stainless steel coated with a fluorocarbon polymer.

51. (Original) A pin valve assembly as in claim 38 wherein:

the fluorocarbon polymer is tetrafluoroethylene.

52. (Original) A pin valve assembly as in claim 50 wherein:

the fluid plate is stainless steel with a substantially flat fluorocarbon polymer shim on its surface that is impinged by the pin block and fitting block.

53. (Original) A pin valve assembly as in claim 38 wherein:

the fluorocarbon polymer is tetrafluoroethylene.

54. (Original) A pin valve assembly as in claim 52 wherein:

the fitting block is coupled to the pin block with the fluid plate positioned between the pin block and fitting block.

55. (Original) A pin valve assembly as in claim 38 wherein:

the pin valves are actuated by an actuator to provide for a distal end of the valve pin to sit in the pin valve seat and removing the distal end of the valve pin from the pin valve seat.

56. (Original) A pin valve assembly as in claim 55 wherein:

the actuator is pneumatically operated.

57. (Original) A pin valve assembly as in claim 38 wherein:

the fluidic components are an HPLC system pump syringe, pump, column, sample loop and sample syringe.

58. (Currently amended) A method of controlling the flow of a fluid comprising:

providing a fluid plate with a connected fluid channel, intersecting pin valve seats, and fluidic fitting ports, the fluid plate having a first surface and a second surface opposite the first surface, the first and second surfaces extending to a periphery of the fluid plate;

supplying fluid to the fluid channel from a fluidic component in communication with the fluidic fitting ports;

moving the fluid by use of the fluidic components; [[and]]

sealing the fluid channel at a selected pin valve seat between a first portion of the fluid channel and a second portion of the fluid channel by impinging on the seat with a corresponding valve pin, wherein both an opening at the first portion of the fluid channel abutting the selected pin valve seat and an opening at the second portion of the fluid channel proximal to a same outer surface of the fluid plate as the opening at the first portion of the fluid channel abutting the pin valve seat are blocked by the valve pin seated in the pin valve seat such that the fluid channel is substantially prevented from flowing between the first and second portions of the fluid channel;

covering the entire first surface of the fluid plate with a fitting block in communication with the fluidic components; and

covering the entire second surface of the fluid plate with a pin block housing the valve pin.

59. (Original) A method of controlling the flow of a fluid as in claim 58 wherein:
the fluidic components are an HPLC system pump syringe, pump, column, sample loop and sample syringe.

60. (Original) A method of controlling the flow of a fluid as in claim 59 wherein:
during a load stage the fluid channel is open for fluidic communication from the sample syringe through the sample loop and from the sample loop through the system syringe and sealed from fluidic communication from the sample loop to the pump, from the sample loop to the column and from the sample syringe to the pump syringe; and,

during an inject stage the fluid channel is open for fluidic communication from the pump through the sample loop and from the sample loop through the column and sealed from fluidic communication from the pump through the column and from the sample syringe through the sample loop and from the sample loop through the pump syringe.

61. (Original) A method of controlling the flow of a fluid as in claim 59 wherein:
during a load stage the pin valves provide for a fluid sample to be transferred from the sample syringe and loaded into the sample loop by a pressure difference created by the pump syringe and during an inject stage the pin valves provide for the sample to be injected from the sample loop into the column by a pressure difference created by the pump.